

Work Order ID 83697

83697

U/R

Page 1

April-23-12 4:00:23 PM

SCRAP

Item ID: D350-748-101

Accept

N9000040100

Setup Start *NS1*

Revision ID: U/R

Stop *NS2*

Item Name: Crosstube Installation, High Fwd



Start Date: 23/04/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 07/05/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: MLJ

Date: 12/04/24

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D350-748-141

F U/R OK 12/04/24

100

100

DOCUMENT CONTROL

DC

Memo

Document Control

Photocopy bluefile & type labels per PPPD350-748-101 CHG002

SCRAP

110

110

BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

CNC Delta 100 Bender

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT

DP 12-5-10

120

QC15- Crosstube Dimensional Check

120

QC

Memo

Quality Control

POSITIVE RECALL

EFFECTIVE _____ AUTH _____

RELEASED _____ DATE _____

punch: issue P1040 meter 7/10/1684
QC12/05/11

QC15 NOT Done.

we'd need + inspect attached e/c to w/o

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
12.05.15	125	T60 NARROW AFTER BENDING AND STRESS RELIEF	<i>[Signature]</i> 12/05/23	SCRAP P12.05.15 ABOUT 1" NARROW ON ONE SIDE	<i>[Signature]</i> 12/05/23	<i>[Signature]</i> 12/05/23	<i>[Signature]</i> 12/05/23	<i>[Signature]</i> 12/05/23

NOTE: Date & initial all entries

83697

Page 2

Accept

N900040100

Setup Start *NS1*

Stop *NS2*

Start Date: 23/04/2012 **Start Qty:** 1.00

*** 1 ***

Cust Item ID:

Required Date: 07/05/2012 **Req'd Qty:** 1.00

*** 1 ***

Customer:

Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

**Insp.
Stamp**

0.00

125

0.00

HandFXtube

Memo

Hand Finishing Crosstubes

Stress relief

Heat treat crosstube as per QSI010 4.3

Temp:

Start time: _____

Finish time:

QC6- Inspect dimensions to drawing

0.00

127

0.00

QC

Memo

Quality Control

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

83697

Page 3

Accept

N900040100

Setup Start *NS1*

Stop *NS2*

Start Date: 23/04/2012 **Start Qty:** 1.00

*** 1 ***

Cust Item ID:

Required Date: 07/05/2012 **Req'd Qty:** 1.00

*** 1 ***

Customer:

Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

**Insp.
Stamp**

0.00

130

Crosstubes

0.00

Crosstubes

Memo

Crosstubes

1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B &C Drill Jigs,
Set-up drill table as per QSI 010

2-Deburr

3-Engrave Part # and Batch # as per Dwg D350-748-141

4-Remove all marks from tube within limits of D350-748-141

5- Apply a light coat of LPS3 on the interior of tube
Batch:

QC5- Inspect part completeness to step on W/O

0.00

140

QC

Memo

0.00

Quality Control

CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 83697

April-23-12 4:00:23 PM

8.3697

Page 4

Item ID: D350-748-101 Accept ***N9000040100*** Setup Start ***NS1***
 Revision ID: U/R Stop ***NS2***
 Item Name: Crosstube Installation, High Fwd
 Start Date: 23/04/2012 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 07/05/2012 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	Outsource process-Cadplate per QSI017 4.1.9.1	0.00							
150									
Outsource3	Memo	0.00							
Outsource process - Cad plate	Issue P/O: Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possibe Supplier: Southwest United Industries Ensure Certificate of Conformity is attached								
160	Receive & Inspect for Damage & Mat'l Certs	0.00							
160									
Packaging	Memo	0.00							
Packaging	Ensure certificate of conformity is attached								
170	QC5- Inspect part completeness to step on W/O	0.00							
170									
QC	Memo	0.00							
Quality Control									

POSITIVE RECALL

EFFECTIVE 12.07.24 AUTH AP

RELEASED _____ DATE _____

1x
 SEE W/O CHG ATTACHED
 12-5-15

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

836.97

Page 5

Accept

N900040100

Setup Start *NS1*

Stop *NS2*

Start Date: 23/04/2012 **Start Qty:** 1.00

*** 1 ***

Cust Item ID:

Required Date: 07/05/2012 **Req'd Qty:** 1.00

*** 1 ***

Customer:

Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

180

180

SprayPaint

Spray Painting

SprayPaint

Memo

1-Prime inside crosstube as per QSI 005 4.2
2-Prime Outside of Tube as per Dart QSI 005 4.2

0.00

0.00

190

190

QC

Quality Control

QC14- Inspect Spray Paint

Memo

Then, Wrap in plastic bag to protect from scratches

0.00

0.00

200

200

Crosstubes

Crosstubes

Crosstubes

Memo

- 1-Install Ground wire Insert,then insert screw and washer
- 2-Install Abrasion strips as per Dwg D350-748-141 & QSI 035.
- 3-Install supports Using Dt8876 as per Dwg D350-748-141,Torque to 60-80 IN-LBS

0.00

0.00

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

83697

Page 6

N900040100

Setup Start ***NS1***

Stop *NS2*

*** 1 ***

* 1 *

Reference:

Run Start *NR1*

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

**Insp.
Stamp**

0.00

0.00

0.00

0.00

0.00

0.00

Quality Control

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 83697

April-23-12 4:00:23 PM

83697

Page 7

Item ID: D350-748-101

Accept

N900040100Setup Start ***NS1***

Revision ID: U/R

Stop ***NS2***

Item Name: Crosstube Installation, High Fwd

Start Date: 23/04/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 07/05/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	Packaging	0.00							
240									
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D350-748-101								
	Location: _____								
	PPP Rev: _____								
250	QC21- Final Inspection - Work Order Release	0.00							
250									
QC	Memo	0.00							
Quality Control									

MF
2-05-22

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April-23-12 4:00:26 PM

Page 1

Work Order ID: 83697

83697

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 23/04/2012

Required Date: 07/05/2012

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 06-07-05 JLM
 IPP Rev:B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev:C Rev B 07-11-15 DD
 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC IPP Rev:F
 10.08.04 added QSI010 4.3 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-141TRN		Manufactured	No			110	Each	1.0000	1	1			
D350-748-141TRN									**				
Crosstube Turning Detail													
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				LG				1					
					83278			1					
ALS4-1032-225		Purchased	No			200	Each	1,850.000	1	1			
ALS4-1032-225									**				
Insert													
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				ST281				1827					
				108696				146					
				110768				62					
				118386				55					
				118966				68					
				121269				1496					
				ST282				23					
				120410				10					
				120451				13					
AN960JD10	NAS1149D0363J	Purchased	No			200	Each	0.0000	1	1			
AN960JD10									**				
Washer													

B74673

JW 12-5-10

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April-23-12 4:00:26 PM

Page 2

Work Order ID: 83697

83697

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 23/04/2012

Required Date: 07/05/2012

Start Qty: 1.00

Required Qty: 1.00

D2856-400

Manufactured No

200 f

353.5345

1.181

1.243158

D2856-400

Abrasion Strip

Location

Loc Qty

Loc Code

ST403

216

81875

216

ST409

137.5345

63735

0.6696

68076

0.3149

71164

8.46

79551

128.09

D3502-1

Manufactured No

200 Each

39.0000

2

2

D3502-1

Support

Location

Loc Qty

Loc Code

ST051

39

73419

19

74873

20

MS21920-20

Purchased No

200 Each

128.0000

2

2

MS21920-20

Clamp (per MIL-DTL-8783C)

Location

Loc Qty

Loc Code

LG050

128

116799

8

120676

20

121067

50

121274

50

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April-23-12 4:00:27 PM

Page 3

Work Order ID: 83697

83697

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 23/04/2012

Required Date: 07/05/2012

Start Qty: 1.00

Required Qty: 1.00

MS27039-1-10

Purchased

No

200

Each

186.0000

1

1

MS27039-1-10

Screw

Location

Loc Qty

Loc Code

GA

100

120449

100

ST291

86

120120

86

AN4-41A

Purchased

No

220

Each

583.0000

8

8

AN4-41A

Bolt

Location

Loc Qty

Loc Code

360

181

121185

181

ST360

402

115108

3

115705

7

117619

27

118451

50

118838

50

119328

100

120423

150

121205

15

AN4-6A

Purchased

No

220

Each

1,497.000

16

16

AN4-6A

Bolt

Location

Loc Qty

Loc Code

ST356

1497

119017

997

121243

500

April-23-12 4:00:27 PM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April-23-12 4:00:27 PM

Page 4

Work Order ID: 83697

83697

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 23/04/2012

Required Date: 07/05/2012

Start Qty: 1.00

Required Qty: 1.00

AN5-32A Purchased No 220 Each 204.0000 4 4

AN5-32A

Bolt

Location	Loc Qty	Loc Code
ST339	204	
119328	39	
119862	50	
120423	75	
120910	30	
121415	10	

AN960JD416 NAS1149D0463J Purchased No 220 Each 10.0000 32 32

AN960.ID416

Washer

Location	Loc Qty	Loc Code
ST351	10	
116289	10	

AN960JD516 NAS1149D0563J Purchased No 220 Each 0.0000 8 8

AN960.ID516

Washer

D3500-1 Manufactured No 220 Each 99.0000 4 4

D3500-1

Saddle

Location	Loc Qty	Loc Code
ST423	14	
78595	14	
ST424	55	
73405	20	
73406	8	
76000	27	
ST425	30	
76940	30	

April-23-12 4:00:27 PM

Shop Packet Print

Page 4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

April-23-12 4:00:27 PM

Page 5

Work Order ID: 83697

83697

Parent Item: D350-748-101

D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 23/04/2012

Required Date: 07/05/2012

Start Qty: 1.00

Required Qty: 1.00

D3501-1 Manufactured No 220 Each 360.0000 16 16

D3501-1

Bushing

Location

Loc Qty

Loc Code

ST051

360

67757

4

70682

82

73391

6

74866

207

77033

61

MS21042L4 Purchased No 220 Each 6,008.000 24 24

MS21042L 4

Nut

Location

Loc Qty

Loc Code

ST300

6008

116188

5

119017

4

119075

999

121011

2000

121444

3000

MS21042L5 Purchased No 220 Each 1,351.000 4 4

MS21042L 5

Nut

Location

Loc Qty

Loc Code

ST300

1351

116105

5

116548

43

117611

30

119109

1273

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

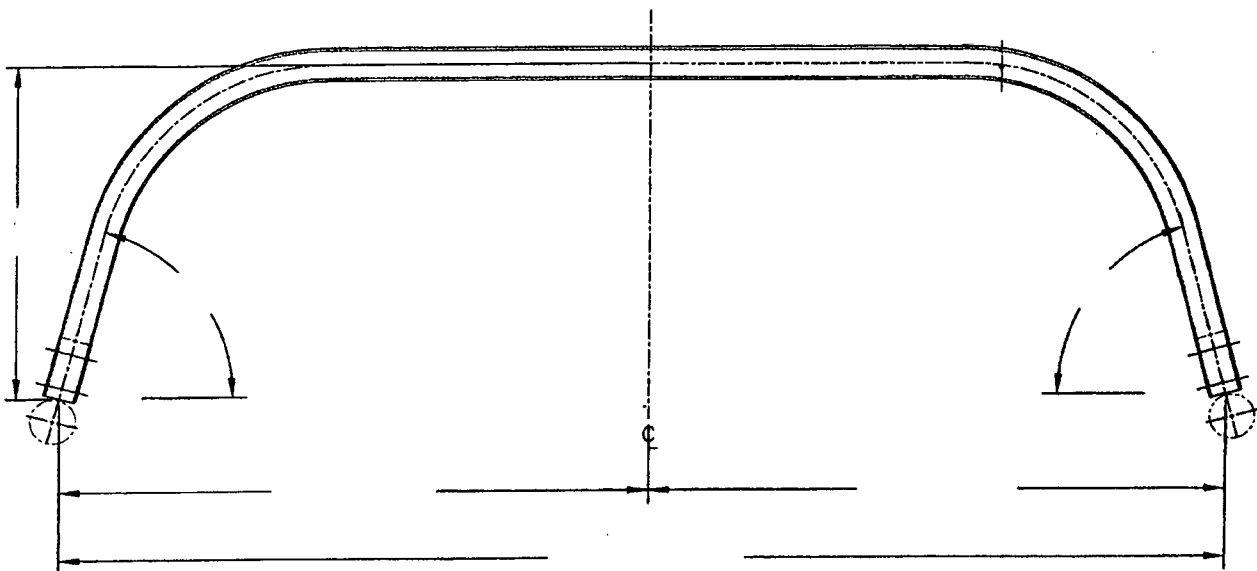
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: 83697
Description: Crosstube High Fwd (AS350/355)	Part Number: D350-748-101
Inspection Dwg: D350-748-141 Rev: F	Page 1 of 1

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	11.11.07	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 83697 MCLJ
12/04/24

UNDER REVIEW

RELEASED
2011-01-18

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.11.23		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. D350-748-141
REV. F
SHEET 1 OF 4

TITLE CROSSTUBE (AS 350/355 HI FWD)
SCALE NTS

COPYRIGHT © 2006 BY DART AEROSPACE LTD
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

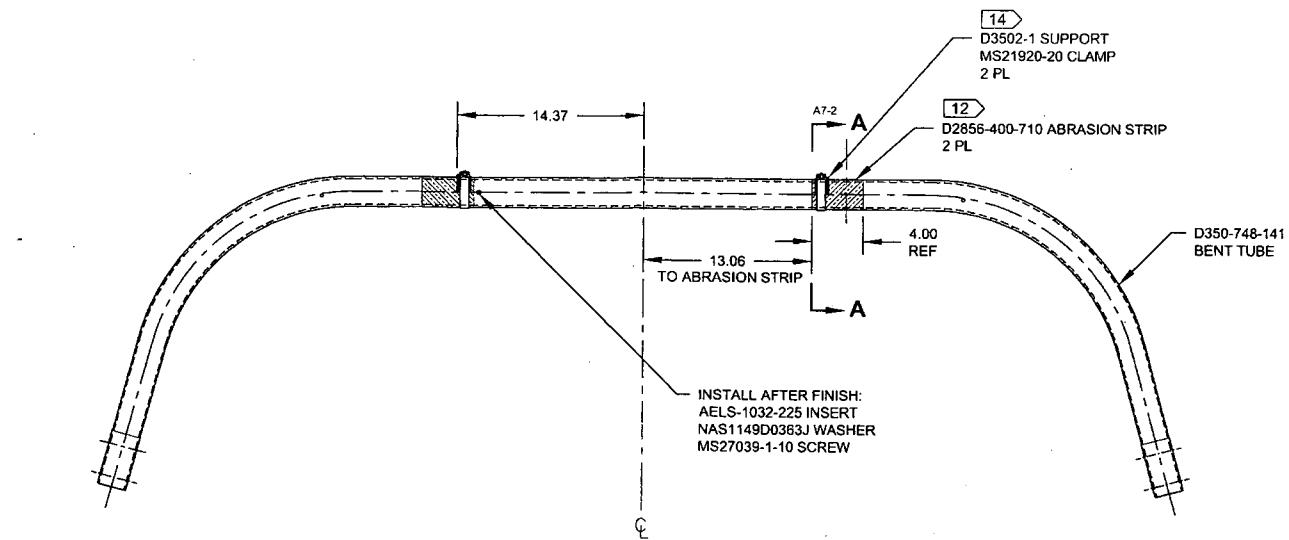
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

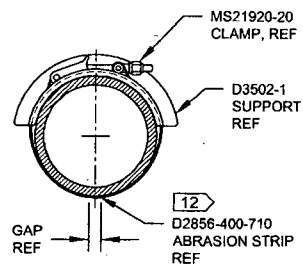
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

83697



**D350-748-141
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 4X

UNDER REVIEW
11.07.11

RELEASED
2011-01-18

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. F
MFG. APPR.		D350-748-141	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2005 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

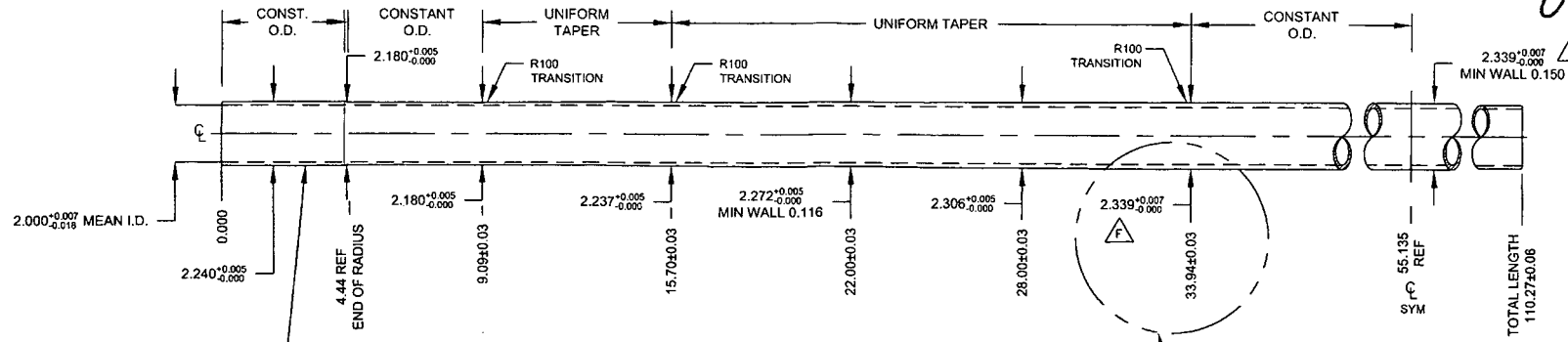
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

8 7 6 5 4 3 2 1

83697

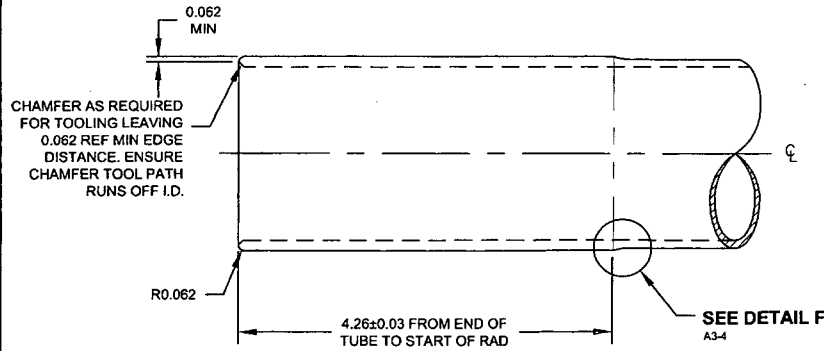


SEE DETAIL D
A6-4

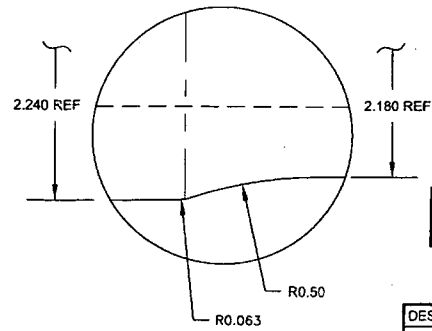
SEE DETAIL E
A1-4

UNDER REVIEW
11.07.12

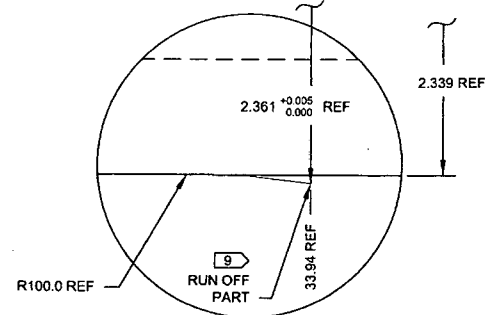
**D350-748-141TRN
TURNING DETAIL**



**DETAIL D:
CROSSTUBE CUFF** C7-4
SCALE 3X



**DETAIL F:
CUFF TRANSITION** A5-4
NOT TO SCALE



**DETAIL E:
TAPER RUN-OFF** C3-4
NOT TO SCALE

RELEASED
2011-01-18

DESIGN	QP	DART AEROSPACE LTD	
DRAWN	QP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	J	DRAWING NO.	REV. F
MFG. APPR.	E	D350-748-141	SHEET 4 OF 4
APPROVED	J	TITLE	SCALE
DE APPR.	J	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2005 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.10.05	161	LOAD TUBE TO 3500 ^{lb} FOR 1 MINUTE. REF D.S. EMAIL.					
11.10.05	162	NDT TUBE.					

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Tuesday, April 27, 2010 3:40 PM
To: 'Mike Petsche'
Cc: 'Bill Beckett'; 'L Lacelle'; 'Chris Provencal'; 'Dan Stow'; ssheldon@dartaero.com
Subject: 350 crosstubes

Mike,

I discussed the 350 crosstube load testing with Bill a little while ago and this plan makes sense to him.

So, my recommendation to clear these crosstubes is to load the fwd crosstubes to 3500 lb and the aft crosstubes to 3000 lb in the deflection test rig and document on the work orders that this test has been completed. Hold max load for 1 minute. Per TP-D350-748-2, these loads represent the maximum load on these crosstubes at gross weight and are below the yield point of the material. I would like to request that Chris Provencal witness these tests and sign off the work orders based on his experience with Dart landing gears. My feeling is that if there is a problem with the parts, it will manifest itself during this load test. I, for one, would feel a lot more confident in testing each crosstube in this manner than relying totally on what Exova has to say. I think it would be very difficult to reach a conclusion on the whole batch on the basis of cracks in two parts from the batch.

I believe that we can accomplish this before next Friday, which also gives us time to hear what Exova has to say in case it has an impact on our decision. So far, what I have seen from Exova shows me that there are fluctuations in the heat treating but the tubes are heat treated to our specification.

For this reason, I believe we should tell DHS that it looks like we will be able to start shipping 350 crosstubes by May 7th pending a successful Engineering test of the material.

David.

DRAWING NO. D350-748-141	TITLE CROSSTUBE (AS 350/355 HI FWD)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D350-748-141 E-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>J</i>	MFG. APPR. <i>KA</i>	APPROVED <i>WD</i>		DE APPR. <i>TH</i>		
DATE 12.04.02	DATE 12.04.03	DATE 12.04.03	DATE 12.04.03		DATE 12.04.03		

PURPOSE:

ADD A STRESS RELIEF OPERATION FOLLOWING BENDING

CHANGE:

ADD

10) AFTER BENDING: STRESS RELIEF AT 650°F ± 25°F FOR A MINIMUM OF 2 HRS.
AIR COOL TO AMBIENT TEMPERATURE
(REF. AMS2759/1E)



Metcor Inc.
560, boul. Arthur-Sauvé
St-Eustache (Québec) J7R 5A8
Tél : 450-473-1884

Certificat de Conformité
Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
175926	1

CLIENT / customer 215
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
18954		Steel		

SPÉCIFICATIONS DU PROCÉDÉ
processing specifications

STRESS REL

SAE AMS 2758/1 REV.E

EXIGENCE / requirement	SPÉCIFICATIONS / specified	TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
Visual			

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
7	210	D350-748-101 (1) CROSS TUBE (1) D350-748-101 CROSS TUBE (1) D350-748-101 CROSS TUBE (1) D350-748-101 CROSS TUBE (1) D350-748-101 CROSS TUBE (1) D350-748-101 CROSS TUBE (1) D350-748-101 CROSS TUBE CONTENANT: 1 PALETTE

COMMENTAIRES / comments

Melcor Inc.
560, boul. Arthur-Sauvé
St-Eustache (Québec) J7R 5A8
Tél. : 450 473-1222

Certificat de Conformité
Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
175926	1

 **Metcor Inc.**

CLIENT / customer 215
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

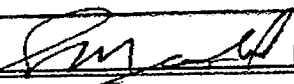

ON K8A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

COMMENTAIRES / COMMENTS

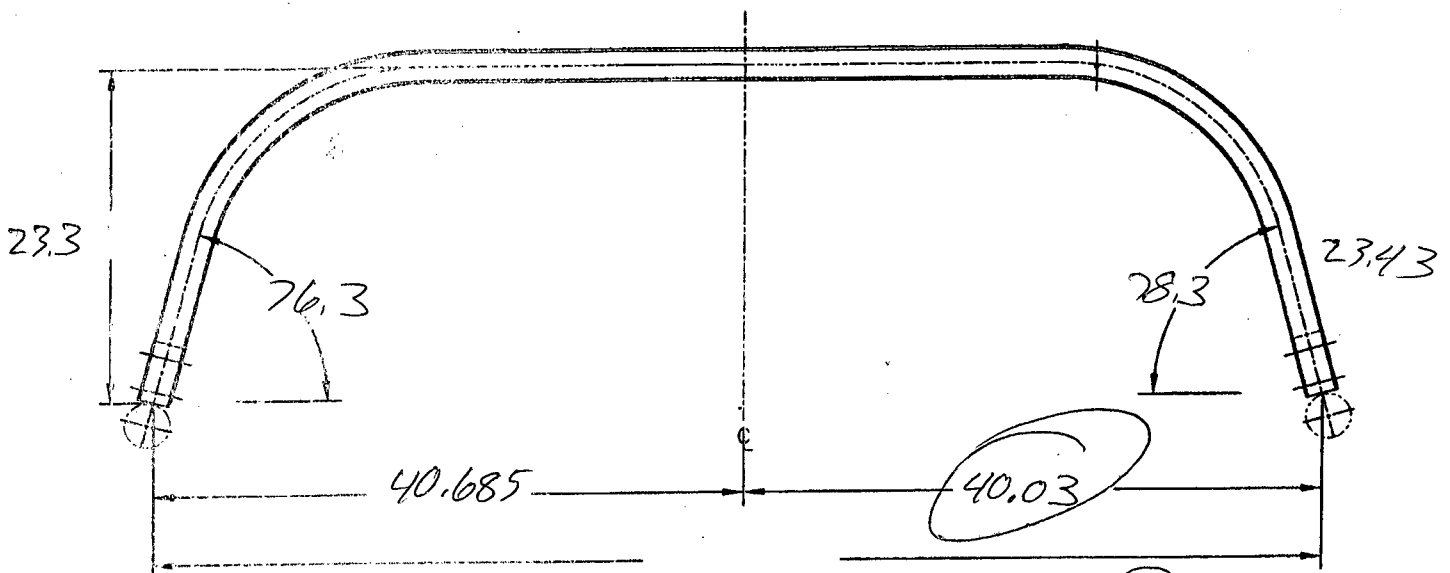
INSPECTEUR / inspector:

DATE: 2012-05-14

DART AEROSPACE LTD		Work Order:	83697
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141 Rev: F		Page 1 of 1	

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
TWIST 0.0
SCRAP 12-05-15 Acceptable 12-05-15 12-05-15

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	11.11.07	Dwg Rev updated	KJ	

4003